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ABSTRACT

Ecological modeling is a holistic systems level approach to situational analysis which can be used in planning activities for lifelong learning in an urban setting. It is the purpose of this essay to present a discussion of ecological modeling in its pure or conceptual sense and concomitantly to translate this analysis into an effective and practical structure for establishing an interactive relationship between urban educative delivery agents and similarly situated user groups. The first element of the model, the community and advisory structure, illustrates the symbiotic relationship which exists between the constituency community, their educational needs, and the various ecological determinants which influence these educational needs. The second element is the advisory group, the structure of which is directly determined by the characteristics of the community to be served. The third element is the delivery system, which possesses interrelated environmental determinants which affect its ability to function. These determinants include the resources of the institutions and personnel. The final two elements of the model are the program/educative experience itself and the evaluation component of the program planning structure. By employing the technique of holistic or systems modeling (ecological modeling) a frame of reference by which forces which influence change in an educative system can be characterized as either positive (beneficial) or negative (adverse) or neutral can be developed. Such a framework will yield forecasts which will make it possible for educational policy to reflect the interaction of the various subcomponents of the supraecosystem. Such a model will also assist in the determination of variations of policy decisions in light of changing technological, economic, societal and political forces. (Author/AM)

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Ecological Modeling: A Tool for The Urban Educator

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Introduction

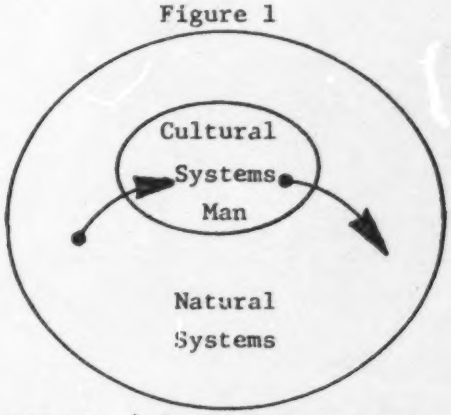
The multivariate character of today's society, especially as effected by technologically related change, makes the development and the delivery of meaningful lifelong learning / continuing education activities a difficult task. Accordingly, educators concerned with the development and implementation of continuing education programs have, over time, proposed various models which can be employed during the programmatic planning developmental process. Among these are Houle[1] who has developed a multi-stage "Fundamental System" model which is designed to relate seven key functions in the decision making process into a holistic program planning matrix. Knox[2] has conceptualized a more complex analytical model which provides the planner with a multi-path structure to employ when operationalizing extended and short term continuing education activities. Hiemstra[3] in a related work has attempted to deliniate those pyscho / sociological variables which can significantly effect in either a positive or negative manner the community reception of a given continuing education offering. Spikes[4] has combined aspects of these models in presenting his framework for lifelong learning program development for the urban university.

Common to each of these structures is the concept of ecological modeling;[5] a holistic systems level approach to situational analysis which can be employed in planning activities for and which can illuminate issues relating to continuing and lifelong learning in an urban setting. It is the purpose of this essay to present a discussion of ecological modeling in its pure or conceptual sense and concomitantly to translate this analysis into an effective and practical structure for establishing an interactive relationship between urban educative delivery agents and similarly situated user groups.

Ecology and Ecological Modeling

What is ecology? Perhaps one of the best definitions has been provided by Handler[6] who has suggested that ecology can be generally defined as a discipline which studies two or more systems in interaction, at least one of which is biological. When viewed from an ecological viewpoint, education can then be seen in terms of a system which interacts with other systems; both systems can then be studied simutaneously. Conceptually, the educational subordinent system is therefore viewed as being part of the total supra-system -- the ecosystem -- the self-contained interdependent community of living things and their environment. Graphically, Oelschlager[7] has portrayed this relationship as indicated in Figure 1 with the interactive nature or patterns of relationships being represented by the arrows.

Figure 1



Oelschlager's Ecological Systems Model

Applying this model to an educative planning framework it is immediately recognizable that environment / ecological analysis presents the initial level of inquiry at which the systematic investigation of a proposed learning activity must occur.

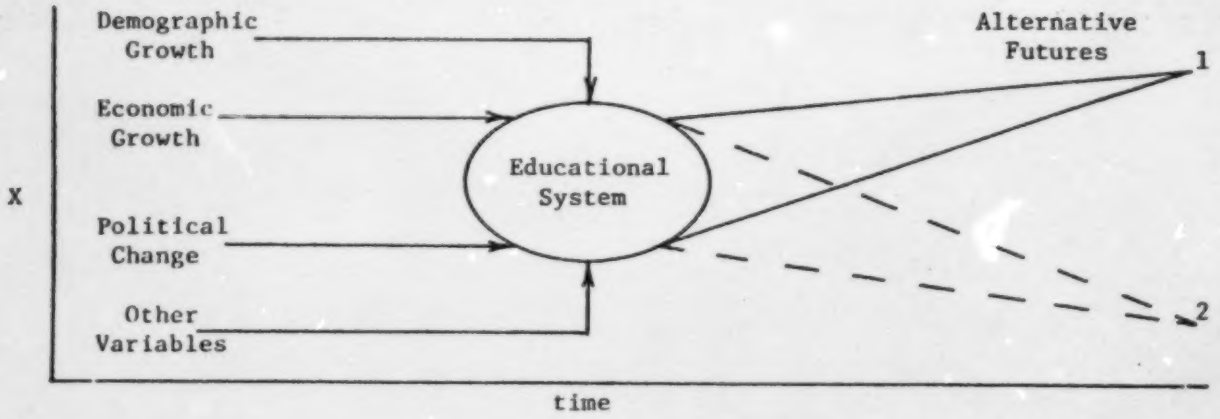
The ecosystem-level of inquiry as applied to an educational planning framework possesses several important features in its interdisciplinary study of living things and their environments. First such an examination frequently reveals emergent behaviors or characterstics of the whole. Relationships among sub-components of sybsystems are easily identified. Characteristics dependent and interdependent upon each other and within the supra-system are readily revealed. Importance of macro-level inquiry is thus heightened with relationships of the total system being clearly identified. Secondly, macro-level inquiry forces the educational planner to ask typically non-typical questions. Sociological, technological, and biologically related inquiry is thus performed. Economic components are examined. Structures within the supra-system -- the ecosystem -- are related to each area of inquiry and thus a holistic plan for achieving the desired educative end is revealed. In a greater sense an ecological analysis assumes that:

> "... an educational system does not exist in isolation from other systems, social, economical, political, technological and natural. The assumption is made that these systems comprise a socionatural system to a specific environment." [8]

Thirdly ecological modeling gives to the educational planner a view of the total structure which might otherwise be absent. Such macro-level inquiry examines new properteries, reveals new behavior which might not appear at lower level of analysis. Inferential linkages between heretofore unrelated subsystems are seen. Finally, macro inquiry provides the educational planner with a tool which can highlight the inter-connections between sub-systemic variables, the supra-system, and the future of the educative activity. Here again this relationship can be graphically illustrated. Figure 2 presents the relationship of the eco-system

vis-a-vis the educative subsystem as related to forcasting alternative future activities.

Figure 2



Eco-System Forcasting Model

Essentially this model presents a diagram which illustrates how a given variable within the system, "X", is dependent upon the extra systematic variables of the supra-system. By projecting different values for differing systematic variables, various alternative futures can be forcast, choices made clearer, additional options identified.

Systematizing Ecological Modeling: A Planning Framework

Given the operational context of macro-system inquiry how can the educational planner, particularly the educational planner in an urban eco-system operationalize this tool into a meaningful weapon in his / her educative arsenal? This question can first be addressed by examining the situational environment of the urban educator using ecological inquiry as the vehicle for this examination.

Beginning with the supra-system it is immediately recognizable that the forces which interact with and act upon urban populations are many in number and vary in nature. Scholars who have examined the nature of the urban setting vis-a-vis its residential populations have identified a variety of situational factors which effect post-secondary educational delivery systems.[9] Among these are Lombardi, who in discussing the particular concerns of inner city colleges has identified change in urban population groups, fluctuating populations and the physical decay of inner city resources as being causal factors for many of the challenges faced by the inner city educative institution; racial segregation, racial unbalance among employees at the administrative and academic levels and an inadequate emphasis upon programming specifically geared for the economically and educationally disadvantaged. Palola and Oswald[10] have examined multi-unit urban community colleges in light of changing populations, roles, and structures evidenced by the deteriorating urban eco-system and have identified the following specific problems within an inner city educative system: 1) fear among faculty and staff of domination of urban post-secondary campuses by single racial groups, 2) failure by faculty to recognize and respond to daily coping and living problems and circumstances within the ghetto, 3) inadequate institutional budgeting models which are not relevant to urban-situated educational programs, and 4) internal conflict which arrises within the institution concerning goals, directions and purposes of the scope and mission of the delivery agent. Similar concerns relating to emphasizing employment opportunities and concomitant training activities for an under-educated inner city population within the curriculum of the urban institution of post-secondary education has been expressed by Amador and McCune[11] in their analysis of Project HEART -- a health related training program for residents of the barrio of east

Los Angeles. Similarly McCluskey,[12] in discussing the adult learner, particularly the urban adult learner, has emphasized the importance of developing and delivering lifelong learning activities for this population of learners using the proven skills of andragogical practice -- the art and science of teaching the adult student. Spikes[13] in his analysis of the relationship of the inner city has called for a similar focus upon implementing sound andragogical practice and cooperative program planning strategies in actionalizing learning activities for an inner city population. To achieve the ends of effecting adequate learning experiences through employing the techniques and conceptual framework outlined in the preceeding discussion of ecological modeling the following delivery model and attendant recommendations for actionalizing the model are offered.

While the program planning function of the university, is often tailored to meet the academic / professional needs of its internal constituency of professors, administrators, and staff, a different focus must be present in the metropolitan inner city university if effective liaison and thus effective programmatic structures for educationally and economically disadvantaged inner city residents are to be formed. Program planning must become a cooperative endeavor which embraces both the university as facilitators of the learning process and representatives of the community as the consumer group to be served. Not only does such a cooperative relationship enhance the ability of the inner-city university to assure an active stance in community development of the urban society but may, as it suggested in the recent literature, positively affect the achievement of the population of adult learners who participate in the planning of the learning experience.[14] The macro-level of inquiry embodied in the ecological modeling process and the holistic analytical / planning approach suggested therein leads

to the development of the model presented in Figure 3.

The first element of this model, The Community and The Advisory Structure illustrates the symbiotic relationship which exists between the constituenty community, their educational needs, and the various ecological determinants which influence these educational needs. Far too often the initial step of effectively identifying the population to be served is loosely performed with a similarly lax assessment of the actual educational needs of the potential clientele being made. Thus while strategies of inquiry for accomplishing the holistic assessment of educative need may vary from person to person and program to program, the seminal nature of the activity cannot be minimized. This concept provides the first and perhaps the most important element of this environmental / educative program planning model. It must be emphasized that within the urban community, as within any universe, the educational needs of the population are strongly influenced by a complex set of environmental determinants including the demands placed upon the universe by the society, the individual participant, technology and the universe itself. In keeping with the theoretical framework of macro-level inquiry all such determinents must be identified, analyzed, and considered during the initial phases of the program development process. When viewed in this holistic manner it is easy to recognize their interrelatedness and the manner in which they interrelate, in both an individual and collective manner, with the educational needs of the constituency to be served.

The second element of the proposed model, is the Advisory Group, the structure of which is directly determined by the characteristics of the community to be served, with its members being generally selected because of their ability to

represent this entity and its related subcomponents.[15] As indicated in the accompanying diagram, the advisory group interrelates in a direct manner with both the community and the educational needs of the community as effected and as influenced by the various external need determining forces and must therefore be viewed as being a significant aspect of any holistic inquiry into the planning process of the inner city university. The interactive nature of this relationship should lead to this body performing such functions as providing ideas for developing new and restructuring existing programs based upon their relationship to any or all of the areas of environmental need determinants, directing needs assessment activities relative to their individual or collective given area of expertise, assisting with community-based problem solving, and acting as the linkage between the urban community, and the educational delivery system.[16] While the advisory group is often misued, with unclear guidelines being established for its operation, or too much or too little power being placed in its hands, the importance of this type of relationship between the community and the urban-based university administration and the program development process cannot be minimized. Much like the relationship of the ecological determinants to the needs structure, the relationship of the advisory group to the program planner is an interdependent one in which each entity serves the other in order to mutually achieve mutually identified goals.

As with the Educational Needs component, the next element of the model, the Delivery System also possesses interrelated environmental determinants which affect its ability to function. Among these determinants are the resources of the institution, personnel, fiscal, physical facilities of the agency, and the posture and or reputation of the delivery agent within the community. Like the ecological effectors of community educational needs, the delivery system and its external determinants

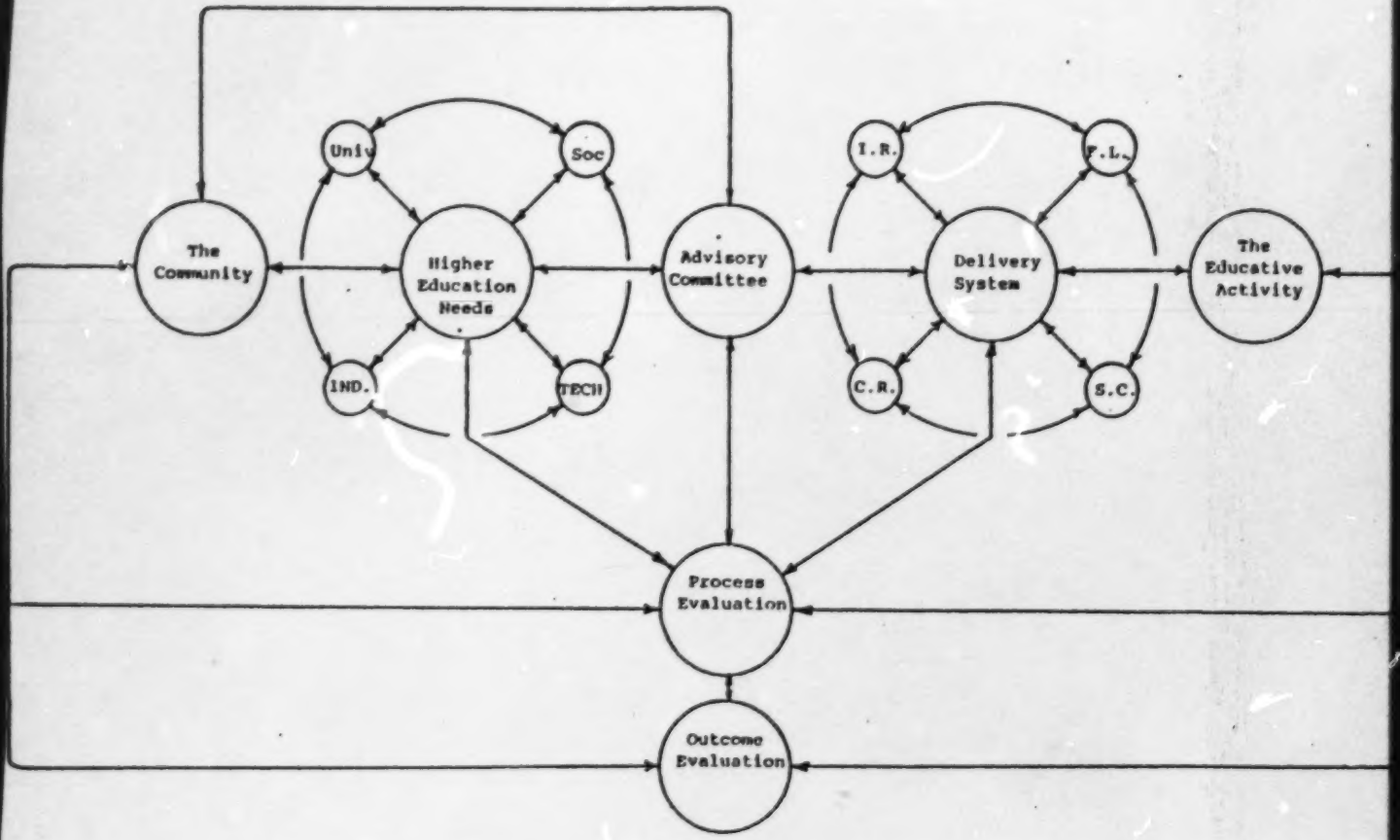
work in a give and take relationship with the major element of the structure and are directly interrelated to the advisory structure which has been developed for the program. Similar relationships exist between the delivery system and its linear predecessors, the community from which all programs stem, and in a holistic sense,the educational needs of the community as affected by the external societal determinants.

The final two elements of this model are the Program / Educative Experience itself and the Evaluation Component of the Program Planning structure. The Evaluation Component of this supra-system model possesses a twofold function and hence is divided into two distinct subsystems. The first subcomponent of the evaluation element is that which is periodic in nature and thus interacts with the planning process at specific points along the linear planning continuum. The second portion is summative in nature, interacts with the periodic process evaluation in a direct manner, and thus examines the ultimate outcome of the learning activity. Both steps in the evaluation process provide the ties which form the prerequisite feedback system whereby future programs may be reviewed in light of current activities.

The second aspect of the theoretical model proposed herein concerns the intra-university operational / administrative criteria required to successfully integrate a community service / community education mission into a inner-city university structure. The urban-university must respond to the ecologically defined educational needs of its constituents in a manner designed to lessen or eliminate the psychological incongruence that exists between the potential consumer of the proposed services. Through effective organization, sound management practice, and a mutually determined, philosophically and actional sound mission

Ecological Modeling:
A Macro-Level Program
Planning Model

Figure 3



and purpose, the traditionally urban oriented university can move from being designed to be a solely self-perpetuating entity to one with a true clientèd-centered focus. Among the managerial considerations necessary to actionalize an eco-systems model in the urban university are:

1) "A recognized source of executive authority capable of taking charge and securing the cooperation of the participants in a harmonious holistic team effort."[17] This concept basically suggests that the chief officer of the urban university must be a manager, who is committed to directing the educative delivery system in a manner consistant with the ecological level of inquiry and practice proposed herein. He must possess an understanding of the general societal and environmental mileau in which the urban university exists and must likewise be willing to assume responsibility in articulating this position to the variety of community leaders and agencies with whom he interacts. Knowledge of and a willingness to carry the services of the university to the educationally and economically disadvantaged urban residents are also a prerequisite for the chief operating executive of the urban-based university.

2) "The availability of a sufficient roster of executive (administrative) manpower desirous of promoting the objectives assumed for the enterprise."[18] Support offices, academic divisions, departments or schools, and other related subcomponents of the university hierarchy must possess similar commitments to and skills in developing and supporting community outreach services as have been articulated for the chief executive officer of the university. In an urban setting this may mean having the capabilities to effectively communicate on the most basic level with the hetrogenious clientele with whom they may interact on a regular basis; language skills relevant to the constituent community being

served, capabilities in relating on a macro-level to the urban learner and an understanding of the characteristics that this person brings to the classroom are all essential to establishing productive interaction between the learner and the facilitator of the educative activity. A humanistic, learner-centered philosophy must prevail throughout the institution; one which embraces a willingness to experiment with alternative forms of education; one which maximize the importance of human needs and effectively deals with these needs in a hierarchical manner.[19] The availability of academic, career, and personal counseling services are also essential elements of the inner-city university's structure.

3) "Precise identification of the operations to be performed and a matching of these with the skills required to assume intended results."[20] Implicite in the premise of a successful management / organization framework is the importance of a holistic identification of the needs of the internal and external university and community based constituency, and the matching of these needs with the competences of the delivery agent. Relating this concept to the role and scope of the importance of the cooperatively initiated environment assessment activities and the relationship that the community and the community-based advisory structure must have to the university and the previously discussed program planning structure, provides additional evidence supporting the macro-level of inquiry and environmental analysis proposed herein.

Summary and Conclusions

Education planning is often a complex science and a difficult art. Complicate a complex activity with the interveening variables -- sociological, geo-political and environment -- existant in the urban ecosystem and many would suggest that the

task of planning meaningful learning activities for inner city residents becomes an impossibility. By employing the technique of holistic or systems modeling -- ecological modeling -- a frame of reference by which forces which influence change in an educative system can be characterized in either positive (beneficial) or negative (adverse) or neutral can be developed. Similarly such a framework will yield forcasts which will make it possible for educational policy to reflect the interaction of the various subcompents of the supra-ecosystem. Likewise such a model will assist in the determination of variations of policy decisions in light of changing technological, economical societal and political forces.

While forces existant in the eco-systems of the inner city of the twentieth century often preclude successful interaction of the urban university with its similary situated consumer groups, all hope must not be lost. Though the particular needs of the urban learner may differ from one micro-system to the next -- obviously and realistically they must -- the educational planner must move from planning, analysis and inquiry at the reductionist level to a more holistic approach. Odum's[21] concept of achieving a truly holistic or eco-systematic approach in various natural and social science disciplines through optimizing macro-level inquiry techniques must be reached. Urban educators especially must grasp this realization for nowhere else in today's society than in the urban ecosystem does coming to grips with the forces which influence change in education appear to be of a more vital and pressing need.

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